

Boston

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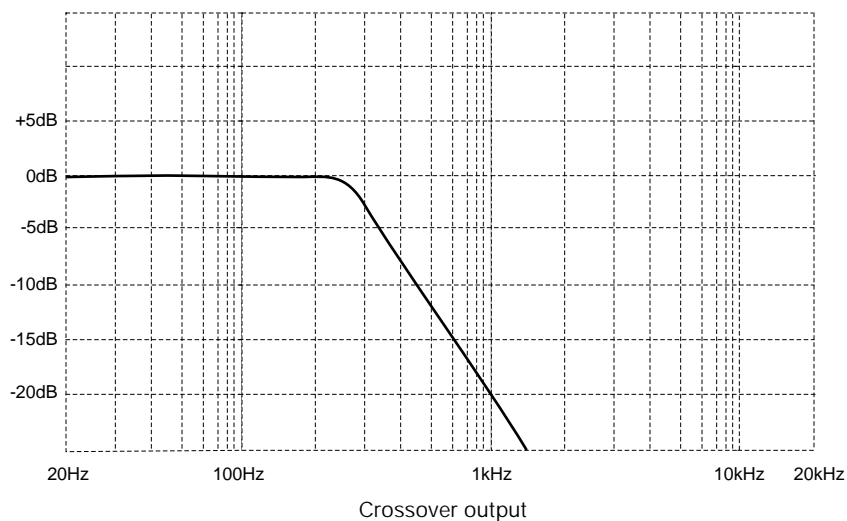
Technical Information

ProSeries 6.5LF Woofer

Mid-bass Crossover Circuit

The Boston Acoustics ProSeries 6.5LF Woofer is a powerful 6 $\frac{1}{2}$ -inch driver specifically designed to handle low-frequency and mid-bass signals down to the subwoofer crossover point. The circuit described here allows the 6.5LF to be added on to existing full-range speaker systems to augment output below 300Hz.

This crossover is easily built using very few components. It is very useful in systems with limited mid-bass output in the front stage, or systems where the mid-bass output is coming from the rear of the car and additional mid-bass output is desired in the front of the vehicle. As you can see from the frequency output curve on the right, there is no low-frequency cutoff in this crossover. Instead, it is preferable to use a two-way electronic crossover between the 6.5LF woofers and the subwoofer in the system. In applications where no subwoofer is present, this crossover also allows the 6.5LF to be the primary deep-bass driver in the system.



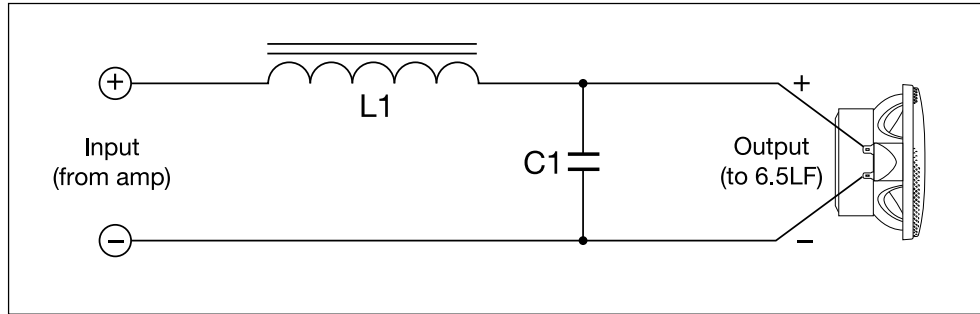
Woofer Installation

When installing the 6.5LF Woofer, it is important to ensure a complete seal between the front and back of the woofer. A very small air leak anywhere near the woofer can dramatically reduce low frequency output and negatively affect the frequency response of the driver. Additionally, it is very important to securely mount the woofer on a rigid baffle. Any energy that moves or vibrates the baffle is energy that is not accurately reproducing sound. The woofer cone should be nearly coplanar with the baffle board. Spacing the woofer off from the baffle or recessing the woofer too far into a cavity can introduce anomalies in the frequency response of the driver.

The 6.5LF Woofer is designed for infinite baffle applications. In most installations it will be mounted in the door of the vehicle without a separate enclosure. If it is necessary to build an enclosure to house the woofer, the enclosure should be relatively large. For a 6 $\frac{1}{2}$ -inch woofer, a $\frac{1}{4}$ -cubic foot or larger enclosure is sufficient. When constructing an enclosure, be sure that the airspace inside is completely sealed from the outside air.

Crossover Schematic

The following is a low-pass crossover circuit engineered specifically for the 6.5LF. The low-pass filter has a 12dB/octave slope with a crossover point of 300Hz. This is very useful when added to systems that are lacking low frequency output. Additionally, it may be used in vehicles that tend to absorb and attenuate mid-bass frequencies. This is a common situation in passenger cars whose doors basically act as "bass traps."



WARNING: This circuit is designed for a single 6.5LF woofer. Two such circuits and woofers are required for a stereo system. The impedance of the driver is a critical part of the completed circuit and each circuit must be wired to only one woofer. If multiple woofers are desired, multiple crossover circuits need to be installed.

Crossover Components

It is important to maintain the component values listed in the parts list. The inductor in the circuit (L1) has a steel laminate core, and a very low DC resistance of 0.22 ohms. This low DC resistance is critical for maintaining the sonic detail in the low frequencies, and to avoid compromising the damping factor of the amplifier. The damping factor is the ratio of the input impedance of the speaker over the combined impedance of the output devices in the amplifier and any resistance in the signal path between the amplifier and the speaker.

Part:	Description:
L1	3.3mH Inductor, 0.22Ω DC Resistance Steel Laminate Core
C1	80μf Non-polar Audio Capacitor 50V Working Voltage

Performance:

This circuit reinforces output below 300Hz in the system to which it is added. The amount of increase depends on the other speakers in the circuit, as well as the amplifier(s) powering the speakers. If this driver and circuit are added to an existing ProSeries 6.5 or 6.5³ system with an additional amplifier of the same model, and increase of 6dB is possible. If this driver and circuit are added to the same amplifier powering the existing system, it is important that the amplifier be capable of driving a 2-ohm impedance. Many high performance amplifiers are capable of doubling their power at 2 ohms. In these cases, a 6dB increase will be realized. If the amplifier does not double its power at 2 ohms, a smaller increase in output will result.

Specification:	6.5LF Woofer
Nominal Size	6 1/2-inches (165mm)
Recommended Amplifier Power	20-500 watts
Nominal Impedance	3 ohms
Mounting Cutout Diameter	5-inches (127mm)
Mounting Depth	2 3/8-inches (60mm)

Specification:	Crossover
Crossover Frequency (-3dB down)	300Hz
Crossover Slope	12dB/octave

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300 Jubilee Drive Peabody, MA 01960 978-538-5000 Fax: 978-538-5199

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